

JUN 30 1951

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Citrus Insect Control

For July 1951

R. M. PRATT, W. L. THOMPSON
AND J. T. GRIFFITHS*
FLORIDA CITRUS EXPERIMENT
STATION, LAKE ALFRED

Most growers and organizations have been applying sprays for scale control since mid-June as rapidly as equipment and weather conditions have permitted. The spray program through July will continue to be primarily for scale control. Populations of both purple and Florida red scales are far below those present last year at this time, but both have been increasing rapidly during the last month. The majority of the scales are in young stages at this time, so conditions for control should continue to be favorable through mid-July.

Purple mites are still abundant and some groves are heavily infested, but average populations are decreasing in all areas except on the East Coast where the infestations became serious several weeks later than in the rest of the State. In general rust mite populations are unusually low for this time of year, but they have been increasing in some groves and populations are excessive in many groves which have not received sulfur sprays since the blooming period. Growers should be particularly alert for increases in rust mite populations, since they may build up very rapidly at this time of year and the rainfall which has occurred will not eliminate the danger from this pest.

Mealybugs are common and are still increasing in abundance. Half of the groves checked during the last month had some mealybugs but the infestations have not been serious except on the East Coast, where numerous growers have been forced

to apply control measures.

Spray Programs

The application of oil or parathion for scale control will continue through July, the choice of which material to use depending on the preference of the grower, the moisture conditions in the grove, and the presence of pests other than scale. Details of the application of these materials will be found in the "Better Fruit Program for 1951."

Where purple mites are still abundant, many growers will prefer to use oil emulsions, which give excellent control of this mite. Oil sprays will control rust mite for a satisfactory period if the population is low at the time of spraying; however, if the mites are abundant, they may again build up to damaging numbers within a week after the application of an oil spray. Where it is necessary to follow the scale application with sulfur for the control of rust mite, a period of at least three weeks should elapse before making this application. If an application of oil is made following a sulfur spray, this should be delayed for three weeks or until two inches of rain have fallen. Parathion should be used at the rate of one and two-thirds pounds per 100 gallons where only one application is made or where a heavy population of scale exists. If parathion was used in the post-bloom period, one pound will suffice.

When parathion is used, sulfur should be included in the mixture for the control of rust mites. If

mite populations are not high, five pounds of wettable sulfur per one hundred gallons is sufficient, but if the mites are abundant, eight pounds should be used. Mealybug populations can be reduced substantially by thorough spraying with parathion.

For more specific information consult the Florida Citrus Experiment Station at Lake Alfred or Fort Pierce.

*Written June 26, 1951. Reports of surveys by Harold Holtsberg, Cocoa; J. K. Enzor, Jr., Tavares; K. G. Townsend, Tampa; J. B. Weeks, Avon Park; and J. W. Davis, Lake Alfred.

PALM BEACH FARMERS PLANT PASTURES, FIBER

Interest in securing land for developing pastures continues high in Palm Beach County, and several new owners will plant about 5,000 acres as permanent pastures, according to Asst. County Agent H. L. Speer.

"In addition, farmers of this area are investigating the possibilities of producing kenaf to meet the needs outlined by the U. S. Department of Agriculture," he said. "Some farmers have found that kenaf, which is an annual, is more practical than ramie, and they plan to plant the fiber this Summer."

Last year United States farmers applied chemical weed killers to more than 30 million acres of crops.

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Florida Citrus Mutual Renames All Officials

At a meeting held in Lakeland on June 26, all of the present officers of Florida Citrus Mutual were renamed, mostly by unanimous vote. A suggestion by the citrus committee of the State Bankers' Association that Mutual purchase and operate processing plants met with harsh opposition and was turned down.

Lacy G. Thomas, of Groveland, was renamed Mutual president by unanimous vote of the 17 directors present. Continued along with Thomas were Vice Presidents William M. Moseley, of Fort Pierce; Alonzo B. McMullen, of Tampa; James C. Morton, of Auburndale, and W. H. McBride, of Seville.

Others reelected were Vernon L. Connor, of Mount Dora, secretary; Judge Clyde Maddox, of Wauchula, treasurer, and Carroll H. Yawn, of Lakeland, assistant secretary. A. V. Saurman, of Clearwater, was reemployed for another year as general manager.

In a surprise move, Director Dan McKinnon, of Winter Garden, introduced a motion for the creation of a "bankers" committee, the purpose of which would be to keep the state's financial men informed on the operations of Florida Citrus Mutual.

David P. Nunn, Jr., of Kissimmee Park, a director from Osceola County, explained that the bankers have a citrus committee in their organization, "hence we should have a banker's committee." McKinnon was named chairman of the new bankers group to serve with A. B. Michael, of Wackson, and James C. Morton.

President Thomas read a statement from the Florida Bankers' Association dated June 14, which generally accused Mutual of failure to gain "absolute control over all Florida citrus from the grove through the packing and processing plants and into the markets."

More specifically, it stated that Mutual had failed to acquire packing and processing plants, adopt a master brand, create a sales organization, and adopt an advertising program. Such an all-inclusive framework was recommended by the citrus committee of the bankers' association June 21, 1949.

General dislike for the entire proposal was displayed by the directors. Open opposition was led by McKinnon

who wanted no part of a plan which would remove individuality from industry by having Mutual take control as an all-powerful, all-purpose agency engaged in packing, processing, advertising, and selling operations.

Morton also registered a hearty dislike for the program as outlined by the bankers. He said the acquisition of packing and processing plants

"would not solve the problem, but would merely put others out of business." He added that the needs of today's citrus growers were being met amply by existing agencies. This was in rebuttal to a statement by the bankers that "current conditions point to the penalty citrus growers must endure because you have omitted these essential elements."

However, McKinnon's "banker" committee will meet with the bankers' citrus committee and a report will be submitted to Mutual's board at its next meeting July 12.

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Publication office at Bartow, Florida. Entered as second class matter February 16, 1920, at the post office at Tampa, Florida, under the act of March 3, 1879. Entered as second class matter June 19, 1933, at the post office at Bartow, Florida, under act of March 3, 1879.

The Effect Of 2, 4-D On Pre-Harvest Drop Of Citrus Fruit Under Florida Conditions

Pre-harvest drop of citrus fruit during some seasons reaches a high percentage of the total crop in certain varieties. Midseason varieties, such as Pineapple and seedling sweet oranges, are generally considered the most prone to heavy pre-harvest dropping. Periods of warm, dry weather during the fall and winter months favor fruit shedding. Losses from this cause may constitute as much as one-third of the total crop and are rarely less than 15 percent. The Valencia variety is not considered such a bad dropper, and indeed fruits rarely fall in such large numbers within a short time as is frequently observed with Pineapple orange near the end of its maturity season. However, the drop extends over a much longer period in the case of Valencias, so that the total losses in this variety also may be very heavy. The rapid decay of grounded fruit and also the covering-up of such fruit from time to time by grove diskilling serves to hide from the grower the magnitude of the losses during a prolonged dropping period.

Following the successful use of naphthaleneacetic acid and naph-

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AT MEETING FLORIDA STATE
HORTICULTURAL SOCIETY

thaleneacetamide to control pre-harvest drop of apples (3), it was reported by Gardner in 1941 (1) that these compounds also could be used to materially lessen the drop of Pineapple oranges in Florida. However, the relatively high concentrations required and the fact that the materials were not found to be effective applied later than November, made the discovery of doubtful practical value. More recently the findings of Stewart and his associates in California have shown that 2,4-D is much more potent in controlling the drop of citrus fruits and, as a result, its use is gaining wide acceptance in that State. Stewart and Klotz (4) sprayed Valencia orange trees in May with a 2,4-D derivative (diethanolammonium 2,4-dichlorophenoxyacetate) in concentrations of 5 to 40 p.p.m.

and reported a decrease in fruit drop, compared with the controls, of up to 55 percent at 40 p.p.m. On Marsh grapefruit Stewart and Parker (5) used the same compound in June in concentrations of 5, 25, 75, and 225 p.p.m. and obtained nearly as good control with the two lower concentrations as with the higher ones; both of the latter caused rather severe foliage damage. It should be noted that the sprays applied in May and June are just prior to harvest period of these varieties in California. The trees at this time would be in a very active condition. This situation will be referred to later, as it may have a bearing on the divergent results secured in the studies here reported with sprays applied in the fall and winter months.

1948 Experiments

Sprays of 2,4-D and several other hormone compounds were applied to Pineapple and Valencia oranges. Trees were chosen for their comparable size and crop in blocks of six. Blocks were replicated ten times and within each block the following six treatments were applied to single-tree plots:

(1) 2-methyl 4-bromophenoxyacetic acid; (2) 2-methyl phenoxy alpha-butryic acid; (3) 2-methyl 4-chlorophenoxyacetic acid; (4) sodium salt of 2,4-D, all four materials being applied as sprays at concentrations of 20 p.p.m. of 2,4-D acid equivalent; (5) isopropyl ester of 2,4-D incorporated with dusting sulphur and used as a dust, also at the rate of 20 p.p.m. of 2,4-D; (6) control plots receiving no spray or dust.

Sprays were applied on October 15 by a ground crew with conventional high pressure rig. Thorough coverage was obtained with 15

less effective, due probably to the poorer coverage than can be obtained with sprays.

Fruit splitting in the Valencias was quite severe during the fall and winter of 1948 in this test grove and therefore all Valencia drops were separated as to split and sound fruit and counted separately. The subtraction of splits from the total drops as presented in the Valencia section in table 1 did not alter the conclusion that 2,4-D had no effect on drop in this variety. Neither was there any influence of this compound on the amount of splitting.

TABLE 1.
THE EFFECT OF SEVERAL HORMONE COMPOUNDS ON PRE-HARVEST DROP OF CITRUS.

Treatments Applied October 15, 1948 Conc. 20 p.p.m. Free Acid Equiv.	Pre-harvest Drop in Percent of Total Crop	Valencia	
	Applied As Pineapple	(+ Splits)	(- Splits)
2-meth. 4-chloro phenoxyacetic	Spray	24.3	37.4
2-meth. phenoxy alpha-butryic	Spray	26.2	43.5
2-meth. 4-bromophenoxyacetic	Spray	25.1	36.2
2,4-D (isopropyl ester) in sulphur	Dust	21.3 ¹	28.7
2,4-D (sodium salt)	Spray	16.3 ¹	36.4
Control	28.6	32.3
			24.3

¹ Statistically significant. Difference between means of 6.9 required for significance at 1% level.

gals. of spray per tree. Temperatures during the time of application ranged from 74° to 82° F. The dust treatments were applied on October 19, a still day on which the temperature varied from 74° to 77° F. All previous drops were removed from beneath the trees and subsequently all drops were gathered and counted, beginning November 1 and at weekly intervals thereafter until the crops were harvested, the Pineapple oranges on February 14 and the Valencias on May 4.

The first three compounds listed in table 1 had previously been found to be very effective (in a class with 2,4-D) in delaying abscission of Coleus petioles—a test used by Gardner and Cooper (2) to screen a large number of compounds for effect on abscission. It is evident that none of the three had any influence in controlling the drop of either of these orange varieties. The data in table 1, however serve to show the very heavy fruit drop frequently encountered in Florida citrus, and that 2,4-D applications effected an appreciable control of this drop in Pineapple oranges but not in Valencias. The reduction in drop of the Pineapple oranges with the 2,4-D spray amounted to 43.1 percent of the drop from the control trees. The dust application was

1949 Experiments

Because of the frequent use of wettable sulphur sprays in Florida for rust-mite control, it was important to learn if 2,4-D could be added to such sprays instead of making a separate application. The 1949 experiments were designed to test this point, as well as to investigate the possibility of higher concentrations of 2,4-D. Both Pineapple and Valencia varieties were included in these tests, which included 6 treatments with 10 replications. The 2,4-D (sodium salt) was used at 25 and 50 p.p.m., both with and without wettable sulphur (10 lbs. per 100 gal.) Dual control treatments were set up consisting of (a) no spray and (b) sulphur only.

centrations of 2,4-D. The highest concentration (50 p.p.m.), while appearing to be the more effective, is not significantly so, and the use of this high concentration would not seem justified. In this experiment the use of 25 p.p.m. resulted in a saving of 1.7 boxes of fruit per tree, compared with the average drop of the controls.¹

It is evident from table 2 that 2,4-D can be combined with wettable sulphur without loss of effectiveness. Apparently there is considerable leeway in the timing of the 2,4-D application (October, November, or December) and combining it with wettable sulphur will rarely present interference with the timing needed for rust mite control.

The 1949 trials with 2,4-D, like those in 1948, were without effect on Valencias. These results are in marked contradiction to those reported from California with this variety. Until more work is done with Florida Valencias, the reason for this disagreement in results can only be surmised. Trees sprayed in May or June in California are in a much more active condition than the trees in Florida that were sprayed in the fall and winter. It is possible that the difference in time of spray application is responsible and that earlier application would be effective in Florida. If this is the correct explanation, it is strange that the Florida Pineapple trees respond so markedly to 2,4-D at any time during their dormant period.

Effect On Other Varieties

Sweet seedling oranges, Temples, and Marsh grapefruit were also sprayed in 1949. The treatments consisted of controls and 2,4-D

¹ A concentration of 25 p.p.m. of 2,4-D

TABLE 2.
THE EFFECT OF 2,4-D WITH AND WITHOUT SULPHUR ON PRE-HARVEST DROP OF PINEAPPLE AND VALENCIA ORANGES.

Treatments—Sprays Applied December 19, 1949	Drop in Percent of Total Crop Pineapple Picked Feb. 13	Valencia Picked May 5
Control—(no spray)	16.8	14.7
Control—wettable sulphur only	17.7	15.4
2,4-D at 25 p.p.m.	6.8 ¹	17.9
2,4-D at 25 p.p.m. with sulphur	6.1 ¹	17.4
2,4-D at 50 p.p.m.	4.0 ¹	19.8
2,4-D at 50 p.p.m. with sulphur	5.3 ¹	14.0

¹ Statistically significant. Difference between means of 5.88 needed for significance at the 1% level.

Table 2 discloses a very appreciable and highly significant reduction of fruit drop in the case of Pineapple oranges at both con-

ditions of 2,4-D. The highest concentration (50 p.p.m.), while appearing to be the more effective, is not significantly so, and the use of this high concentration would not seem justified. In this experiment the use of 25 p.p.m. resulted in a saving of 1.7 boxes of fruit per tree, compared with the average drop of the controls.¹

sprays at 25 and 50 p.p.m. without wettable sulphur. Each treatment was applied to single-tree plots with 10 replications. Unfortunately, picking crews harvested the crops without notifying the experimenters and thus no record of the amount of crop on the trees at picking date was obtained on which to base percentages of drop. With only the week-by-week pick-up record of dropped fruit from the sprayed and non-sprayed trees, no definite statement can be made as to the effectiveness of the sprays on these three varieties. The partial data, however, suggest that 2,4-D was reasonably effective on sweet seedlings and Temple oranges but was not at all effective on Marsh grapefruit.

Injury To Citrus From 2,4-D

Fall and winter applications of 2,4-D at a time when young growth is not present and not anticipated for some weeks to come, have not resulted in any observable effect on the foliage on the tree at the time. In the following spring when new foliage appears there are nearly always a few leaves to be found that show 2,4-D effects. This is true almost regardless of the weakness of the concentration used. The deformed leaves are few in number and may not appear except on occasional trees, and they are not cause for alarm.

The lack of damage from low concentrations of 2,4-D should not lull the grower into the belief that high concentrations can be safely applied to or around citrus. A disastrous instance was observed in which 2,4-D at 1000 p.p.m. was applied to eradicate a dense stand of *Callicarpa americana*, growing as a weed in a block of Pineapple oranges on Rough lemon roots. The application was made in midsummer and care was taken to avoid spraying the trees directly. A heavy rain shortly thereafter washed the 2,4-D down to the Rough lemon roots and resulted in severe damage and eventual death of the trees. The same weed in another grove nearby was treated in the same manner with the same spray and on the same day. This grove was on sour orange roots and in somewhat heavier soil. It escaped any visual damage. Presumably the difference in response can be attributed chiefly to the difference in rootstock,—the Rough lemon

apparently being more sensitive than sour orange.

Acknowledgements

We wish to express our thanks to the Chase Investment Company at Windermere, Florida, for their generous cooperation and assistance in applying the sprays for the Pineapple and Valencia tests. Our appreciation is also extended to Mr. G. F. Randall of Orlando for permitting the use of his groves for certain of the experiments.

LITERATURE CITED

1. Gardner, F. E. Practical applications of plant growth substances in horticulture. *Proc. Fla. State Hort. Soc.* 54: 20-26, 1941.
2. Gardner, F. E., and Cooper, W. C. Effectiveness of growth substances in delaying abscission of Coleus petioles. *Bot. Gaz.* 105: 80-89, 1943.
3. Gardner, F. E., Marth, Paul C., and Batjer, L. P. Spraying plant growth substances for control of the pre-harvest drop of apples. *Proc. Amer. Soc. Hort. Sci.* 37: 415-428, 1939.
4. Stewart, W. S., and Klotz, L. J. Some effects of 2,4-D-dichlorophenoxyacetic acid on fruit drop and morphology of oranges. *Bot. Gaz.* 109: 150-162, 1947.
5. Stewart, W. S., and Parker, E. R. Preliminary studies on the effects of 2,4-D sprays on preharvest drop, yield, and quality of grapefruit. *Proc. Amer. Soc. Hort. Sci.* 50: 187-194, 1947.

ADVISORY COMMITTEE REVIEWS RESEARCH

Studies of problems in connection with heavier loading of freight cars were given top priority by the Transportation Advisory Committee at its meeting in Washington just recently with U. S. department of Agriculture representatives. The Committee operates under the Research and Marketing Act.

Anticipating the probability of regulations requiring the heavier loading as a result of the growing emergency, the committee felt that it is impossible to know how much breakage and loss of product quality might result and to what extent the business practices of shippers and receivers might be disrupted. As larger loads per car should reduce costs per ton of product shipped, the committee urged exploration of possibilities of rate reductions for heavier loads of agricultural products.

The committee reviewed the various types of research and service work the Department is conducting in the transportation field. It felt that this work was making an important contribution in getting agricultural products from producers to consumers in better condition and at a lower cost. Ad-

justments proposed in the program in light of the emergency situation were discussed by members of the Department staff and approved by the committee.

New lines of work recommended in addition to studies of heavy loading included:

- (a) Develop an improved method of obtaining a continuing record of the extent of freight car delays;
- (b) Bring up to date the information of the effect upon agriculture of Federal excise taxes on transportation of freight;
- (c) Expand research and educational work to prevent bruising, and assure proper handling of perishable products;
- (d) Determine the amount of weight shrinkage, if any, in various prepackaged products between shipper and consumer;
- (e) Develop a handbook for shippers on the kind of protective service required during transportation by various products under various weather conditions;
- (f) Conduct studies to develop lightweight truck bodies that will provide proper protection for farm products.

CITRUS SEED TO TEXAS MUST BE ACCOMPANIED BY STATE CERTIFICATE

Gainesville, Fla.—Florida people who want to ship citrus seed to Texas should get certificates from the State Plant Board in Gainesville before they send the seed, says Arthur C. Brown, plant commissioner.

The Florida commissioner says Texas authorities require duplicate certificates with citrus seed from this state. The original should be attached to the outside wrapping of the container and the duplicate sent to the Commissioner of Agriculture, Austin, Texas.

The Texas authorities also require each shipment to be accompanied by shipper's affidavit that the seed have been treated in a 1 to 1,000 corrosive sublimate (bichloride of mercury) solution.

Mr. Brown says the seed should be thoroughly dried after treatment to prevent heating and injury in transit. Also, he warns that corrosive sublimate is a deadly poison and should not be taken internally.

Uncertified shipments of seed are subject to confiscation by Texas authorities.

An Engineering Analysis Of A Citrus Problem

One of the major problems of the citrus juice industry is the disposal of the waste peel, pulp, and juice. These wastes can not normally be handled by sewage treatment due to the very high BOD. They must be either dumped or hauled away to drying plants where the product is converted into a cattle feed and other by-products. The problem for consideration in this paper is the design of a storage bin to hold this waste product in the canning plant before it is hauled away.

In designing such a bin four conditions must be satisfied: The first is that the size of the bin be sufficient to hold 50 tons of citrus waste peel and pulp, or of sufficient capacity that one truck can make a haul of 20 miles, and have adequate storage in case the truck is delayed. The second requirement is that the bin fit within dimensional limits available. The maximum height is governed by the screw conveyor coming from the existing plant. The minimum height will be controlled by the clearance required for a 15 ton truck, and the width between supporting columns must be sufficient to maneuver this same truck underneath the bin.

Maintenance and sanitary conditions constitute the third condition. It is to be kept in mind that this bin serves a plant in which juice is being canned. It is important that no accumulation of peel or pulp be permitted in or around the bin. The inner surface must be smooth and all corners or pockets must be eliminated where there is danger of retaining the pulp or peel after dumping. The design must prevent any dripping around the entire structure, and all surfaces must be accessible for cleaning and washing.

The fourth and last condition is the corrosion resistance necessary to insure long life. The material selected must be able to withstand the atmospheric conditions on the outside, as well as the high cor-

NORMAN W. HART, JR.,

AT MEETING OF
FLORIDA ENGINEERING SOCIETY
IN LAKELAND

rosive effect from the citric acid inside. This selection of material must be obtained at a low cost to be justifiable economically.

The results of the engineering solution to the specific conditions of this design problem may be seen in the photograph of the waste bin. Based on a peel and pulp weight of 50 pounds per cubic foot, the desired capacity of 50 tons resulted in 2,000 cubic feet. The screw conveyor may be seen projected over the top of the bin. This conveyor is 24' off the ground. A vertical truck clearance of 10' 6" was provided under the bin. It will be noted that the supporting columns are bracketed out slightly from the side of the bin to provide a minimum roadway clearance of 13' 6". A round bin with a conical 45° slope bottom provides more cubic feet space per square foot of material used than either a

square or rectangular bin.

Many items were considered in selecting the specific materials to be used in order to satisfy the conditions required of maintenance, sanitation, and corrosion resistance. As a rule paints and mechanically applied or bonded materials have not withstood the high corrosive effect of citric acid, nor do they generally meet the sanitary regulations requiring cleaning with hot caustic and live steam.

In considering the construction of a wooden bin, the disadvantages outweigh the advantages, as was proven by this analysis and by experience. The cost of a wooden bin is actually higher than the bin presented in this paper. Since the juices soak into the wood, the lumber construction deteriorates rapidly; and no protection can be expected from painting. In a wooden bin the juices and pulp will squeeze out and drip to the ground, leaving a very unsatisfactory condition. The total effect of a wooden bin—it is hard to keep clean, results in high maintenance, and has a life span of five to ten years.



Fig. 1. Showing waste bin with truck entrance under bin.

Since wood is not practical, we must consider a metallic material. In this classification, low-cost carbon steel offers economical first cost, but is not resistant to corrosion and can not be expected to last an appreciable length of time. Stainless steel, having 18% chromium and 8% nickel as the principal alloy elements, known as "18-8", is used extensively in food handling and processing equipment.

From the standpoint of appearance and corrosion resistance this material is very satisfactory. The cost of stainless steel sheets to meet the design stresses required, however, is very high.

This brings us to the consideration of a clad sheet consisting of mild steel bonded to stainless steel to form a homogeneous sheet. The stainless steel cladding usually constitutes 20% of the total thickness of the sheet. As a cost comparison we can consider the following relative prices of these three steels: Low carbon steel at \$110.00 per ton; stainless steel at \$840.00 per ton; and stainless steel clad onto mild steel at \$590.00 per ton.

Stress calculations indicate the need of a 3/16" thick clad steel to satisfy the requirements at the greatest stress concentration, which will be at the juncture of the cylinder and the con. Actually the bursting pressure in this design is insignificant.

Obviously the electric metallic arc welding gives the most economical and satisfactory means of fabrication. Good welding procedure indicates that the first be run on the stainless steel side using a 3/16" diameter 25-12 welding rod. The use of a rod with these high percentages of chrome and nickel will reduce the tendency to precipitate CR4C (chrome carbide). If this precipitation is not kept to a low point, the corrosion resistance of the weld will be greatly impaired. Direct current, reversed polarity, and the positive electrode will result in faster melting and faster welding. This will tend to prevent the establishment of large pools of molten metal which will increase the carbon pickup from the mild steel backing.

The second bead will be on the mild steel side and should be a 1/8" diameter 18-8 rod. The welding current on the mild steel rod is recommended at 90 amperes and on the stainless steel side at

45 amperes.

This bin costs \$2,340.00 in materials plus \$800.00 for labor. If we add the cost of overhead and design the total net cost will be less than \$5,000.00. This may be compared with two wooden bins, having a total capacity of forty tons, made of cypress, which cost over \$5,000.00. The owner is highly dissatisfied; the open slat construction drips continually; the maintenance is high; and in a few years the bin must be replaced completely.

In conclusion, let me emphasize

that the satisfactory solution for any design problem can be obtained by the proper engineering analysis. I hope that this paper has presented for your consideration some worthwhile principles.

RAINS DAMAGE CROPS

Very heavy rains early in May caused severe damage to many acres of vegetables in Hardee County, according to County Agent E. H. Vance. Many fields of cucumbers and tomatoes were ruined by the downpours.

CUT SPRAYING COSTS - - INCREASE EFFECTIVENESS

Naturally every citrus grower is vitally interested in facts and is seeking the best and most economical method of spraying that will give him satisfactory results and save him money in materials and labor costs.

Compare These Two Methods

The average oil spray method usually involves the following procedures:

- (1) You spray with oil for control of scale.
- (2) You follow this up with a spraying or dusting of sulphur for rust mite control which usually lasts about six weeks.
- (3) You follow this up with a spray for red spider to control this pest.

Double X Spray Users Report

That you may spray with DOUBLE X Spray for control of scale, red spider and six spotted mite. Add wettable sulphur and you should have rust mite control for 90 days to four months . . . ALL IN ONE OPERATION.

We invite you to compare the costs of one application of DOUBLE X Spray with the other program, remembering, too, that you are not using an all oil-spray and your trees and foliage are not covered with oil so that they can breathe and develop.

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Publication Office 550 North Broadway, Bartow, Florida
Telephone - - - - - 269

Published Monthly By	
ASSOCIATED PUBLICATIONS CORPORATION	
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S. LLOYD FRISBIE	Sec.-Treas. - General Manager
LOYAL FRISBIE	Business Manager
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Subscription, \$1.00 per year in advance
Outside Continental United States, \$2.00 in advance

FLOOR PRICE ON ORANGES WITHDRAWN

The recent controversy, to call it by no stronger name, between Florida Citrus Mutual and Snow Crop, citrus fruit processors, had all elements of the Florida citrus industry on tenterhooks during a portion of the past month.

Mutual had set a floor price on oranges of \$2.35 per box delivered to the canning plants; Snow Crop objected to the price established by Mutual and offered \$1.75 per box delivered, a sixty cent cut from the floor price. In the verbal debate which followed, many uncomplimentary things were said; some incriminating remarks were made; the feud was discussed and cussed from every angle.

Possibly the floor price established by Mutual was too high — processors claimed that it was; growers, naturally, claimed that it was not. At any rate, Mutual withdrew its floor price thus permitting members to sell on the open market for the best price obtainable. So ended the first round with Snow Crop the winner.

Florida Citrus Mutual was founded with the view to so controlling distribution that a fair profit might be assured growers of citrus fruits. With a membership of approximately 7,000, controlling about 88 percent of the state tonnage, it was felt that such a condition could be brought about. This membership, consisting primarily of growers, but taking in also packers, shippers, canners, concentrators and other processors, had for the most part worked harmoniously up to the time of the break with Snow Crop. Incidentally, Snow Crop and other processors retain membership in Mutual.

What the ultimate result may be is a matter for the future to decide. Certainly it is to be hoped that this great super-cooperative will continue to function. Only when every element of the industry is working together can profitable operations be enjoyed by all; otherwise the old law of supply and demand will fix the price unhampered by any overhead organization. Only through orderly marketing and honest dealings with one another can growers, dealers and processors hope for successful and profitable operations. It would seem that Florida Citrus Mutual is the one organization which holds out promise of bringing about such a condition.

FLORIDA CITRUS MUTUAL DEDICATES NEW BUILDING

On June 19, Florida Citrus Mutual publicly dedicated its new \$175,000 headquarters building in Lakeland, a picture of which adorned the front cover of this magazine last month.

Coming, as it did, just following the major controversy between Mutual and Snow Crop, it attested the confidence of Mutual leaders and members in the permanency of the organization.

When Mutual was established with the aid of many of the foremost leaders of the industry, and with the encouragement and good will of Florida bankers, Florida newspapers and Florida industrial and commercial leaders, it was hoped that it might bring together in cooperative spirit all elements of the industry. To a certain degree this hope has been realized. There has been less of strife, less of bickering, less of log-rolling in the industry than ever before. While Mutual has not attained the full measure of the perfection which had been hoped, it has paved the way for more of mutual understanding, more of a spirit of confidence, more of a spirit of give and take, more of an attitude of tolerance of the other fellow's views and the other fellow's aspirations than existed before.

On the material side, Mutual has accomplished much in the stabilization of prices, in furthering of orderly marketing, in the adjustment of grower problems to the actuality of existing conditions. It has been a bright spot in a sometimes discouraging picture.

FLORIDA CITRUS CODE MAY REACH HIGH U. S. COURT

Florida's citrus code which has withstood numerous attacks in Florida courts, and which has just come out successfully from an appeal to the Florida Supreme Court, seems destined to be taken before the United States Supreme Court for final adjustment.

The Florida Supreme Court has recently upheld a decision of the Polk County Circuit Court ruling, dismissing an attack on the grade labeling provisions of the 1949 Florida citrus code.

The case was appealed from the Polk court decision by Lakeland Highlands Canning Co., Inc., questioning the right of the code to insist upon certain labeling conditions.

Snow Martin, attorney for the canning company, has declared that the case will be taken before the United States Supreme Court on appeal from the decision of the State Supreme Court. The code has been under severe attack from several quarters ever since its passage in 1949, but has been uniformly sustained by Florida courts. Backers of the code, it is said, would welcome a final decision by the highest court in the land.

Field men report recent rains throughout most of the citrus belt and that in consequence trees generally are in excellent condition.

Florida's Stake In Plant Quarantine Enforcement

As everyone knows, injurious insects and plant diseases constitute serious obstacles to agricultural production. This seems to be true the world over. Fortunately or unfortunately the destructive organisms that cause greatest losses in one part of the world may not occur in others. This feature of their distribution gave rise many years ago to efforts in various parts of the world to set up restrictions aimed at protecting the agricultural industry of one country from plant pests known or believed to occur in another. These restrictions which we call quarantines were in effect in some parts of the world long before the United States first gave consideration to its need for similar plant-pest protection. By 1912 when this country first enacted legislation for this purpose many injurious insects and plant diseases had found their way here and had become established. As fruit and vegetable production is particularly vulnerable to attack by these organisms, many States were united in urging upon Congress the need for action. The State of Florida, because of its tremendous production of these articles, was and continues to be one of the leaders in urging the need of some means of screening the arrival here of additional pests. Florida is particularly vulnerable because of climate, crop specialization, geographical location, and proximity of serious insect pests and plant diseases within easy reach of Florida ports by air and water.

In 1912 Congress passed the Plant Quarantine Act authorizing the Secretary of Agriculture to promulgate rules and regulations to safeguard the importation into this country of nursery stock, fruit, and other plant products. It has been the policy of the Department to take such action on a biological basis. Care has been taken to avoid the use of this authority in furtherance of economic or competitive conditions. Quarantines that have been promulgated have been aimed at specific subjects and

AVERY S. HOYT, CHIEF
BUREAU OF ENTOMOLOGY AND
PLANT QUARANTINE,
WASHINGTON, D. C.
AT MEETING FLORIDA STATE
HORTICULTURAL SOCIETY, 1950

have been accompanied by minimum restrictions consistent with the objective of protection from insect pests or plant diseases not known to occur or to be widely distributed within this country. The restrictions issued under this legislation by the Secretary of Agriculture have varied during the years, depending to some extent on the nature of the material which formed the large percentage of the imports, upon information with respect to pest risks, and upon the advisability of the application of methods of treatment

to safeguard the importations.

Much of the information on which plant quarantines have been put into effect through this authority by the Secretary of Agriculture has been accumulated by the Bureau of Entomology and Plant Quarantine. In the case of plant diseases the basic information has frequently been furnished by the Bureau of Plant Industry, Soils, and Agricultural Engineering. In the case of every foreign plant quarantine the objective has been to get the most accurate knowledge possible with respect to the distribution of the insect or disease, ways in which it might be transported, materials on which it would be most likely to be carried, the possibility of destroying the organism through the application of treatments at destination or port

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In the production of good crops and big yields . . . and we suggest that one of the best ways of keeping your trees healthy is to see that they are provided the proper food elements to be found in Florida Favorite Fertilizers.

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of entry, and the probable damage likely to occur in this country in the event of its introduction. In general the policy on which quarantines have been established has been to consider the biological necessity to exclude a specific plant pest and then to provide such restrictions on the importation of the plants or parts thereof which serve as the host as will most adequately protect domestic agriculture.

With the passage of the Plant Quarantine Act the responsibility for dealing with foreign quarantine problems was placed on the Federal Government.

Plants and other restricted commodities imported into this country are considered to be in foreign commerce until actually arrived at the point of destination. It has been held by legal advisers of the Department that the States do not have authority over such commerce until delivery to the ultimate consignee. At that point under the State police powers the State plant quarantine officials have authority to make inspections and take appropriate action.

As a result of research, much of which has been done by the Bureau of Entomology and Plant Quarantine, means have been developed to destroy injurious insects on various types of commodities through the use of commodity treatments. These methods of treatment are required as a condition of entry for many different kinds of plants and plant products. Temperatures, both hot and cold, for specified periods of time, poison gases, and various insecticidal dips may be required. These methods of treatment may be prescribed in some cases after inspection as a precaution and in some cases are required as definite conditions of entry. In the case of fruits originating in countries where fruit flies of various species are known to occur, the time-temperature treatments are required as a condition of entry. There are 3 general procedures under which these treatments may be applied: (1) At port of entry under the supervision of representatives of the Bureau; (2) in the country of origin and at the present time this is applicable to Mexico where arrangements have been made whereby representatives of the Bureau may do such work at the expense of the exporters, and (3) the application of the

treatment in transit. It has been found that the temperature and the exposure duration are not the same for all species. More extreme temperatures and longer time intervals are needed for some. These commodity treatments are effective when properly applied and with experience it has been possible to simplify and standardize equipment and procedures to make their application more effective and less costly.

One of the serious problems is our inability to recognize the symptoms of, or to control, that class of diseases which is caused by the presence of a virus. In the inspection of nursery stock entering the United States it has been found impossible through inspection at the ports of entry to be sure as to the presence or absence of a number of virus diseases. It was primarily because of the need to strengthen our protection against virus diseases accompanying imported nursery stock that led to the revision of Quarantine 37, the Nursery Stock, Plant, and Seed Quarantine, a few years ago providing the requirement of growing the materials for a specified period of time in post-entry detention to permit inspection during one or more growing seasons.

It is recognized that the postentry procedures leave something to be desired. It is not the best procedure to bring plants into this country, establish them in our soil, and then await the possibility that they may have brought some serious infestation or plant disease. It is believed, however, that inspection during the growing season offers the best chance to detect the presence of virus diseases in plants. It is hoped that it may be possible to arrange that our inspectors may examine the material in the country of origin. Inspection of the growing material in the nurseries abroad and the rejection there of material which appears to threaten our welfare would seem to be more practicable and effective. If the means and the trained men were available to inaugurate such a program it would be necessary that there be an invitation from the countries involved to make the inspections within their borders. Some progress has been made in this direction. Inspectors of the Bureau have visited a few countries on specific errands involving the inspection and applica-

tion of treatments for the safeguarding of materials destined to be shipped to this country. It is believed the recognition of the advantages of this method of procedure will grow and it is hoped that by this means a satisfactory substitute for the present system of postentry inspection may be developed.

A step in the direction of more effective international cooperation was taken when the United States was represented at the recent International Conference on Plant Quarantine Regulations convened by the Netherlands Ministry of Agriculture at The Hague. This initial conference resulted in a draft of an international agreement which is now before the countries concerned for consideration. Its provisions include: Statements of Purpose and Responsibility; Supplementary Agreements under the Convention; Establishment of National Organization for Plant Protection; Requirements in Relation to Exports; Requirements in Relation to Imports; International Cooperation; Amendment of Convention; Settlement of Disputes; Treatment of Non-adhering Countries; Ratification and Adherence, and Effective Date. From participation in this Convention it is believed the United States should benefit. The question has been asked whether this would mean that the Federal inspectors would have to accept certificates from officials of other countries. The answer to this is no. We do not have to accept their certificates now and the proposed standardization would not modify this authority. To my knowledge no agency of the Federal Government has sought to influence decisions of the Department of Agriculture based on biologically sound requirements for imported plant material. From the stand-

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point of this country it is believed international discussions such as this International Agreement contemplated may afford us a chance to establish relations with other countries which it is hoped may lead to the opportunity for our inspectors to work with their inspectors in the nurseries from which shipments are made to the United States. It is our hope that this would furnish some first-hand information about the conditions surrounding the material which is offered for entry into this country.

In recent years plant pests have been transported over long distances as never before through the movement of airplanes. Planes taking off in one part of the World and landing in another all between sunrise and sunset means that living insects may be transported and become established as has not been the case with slower transportation. Florida has occasion to fully understand the consequences in terms of dangers of plant pest distribution due to the enormous increase which has taken place in international air transportation. The burden of inspection which has fallen on the Florida State Plant Board in Florida and on the Bureau of Entomology and Plant Quarantine throughout the country is in direct proportion to the expansion in this activity. In the first 9 months of 1950, 14,500 planes from foreign ports were inspected in the State of Florida by State and Federal inspectors cooperating.

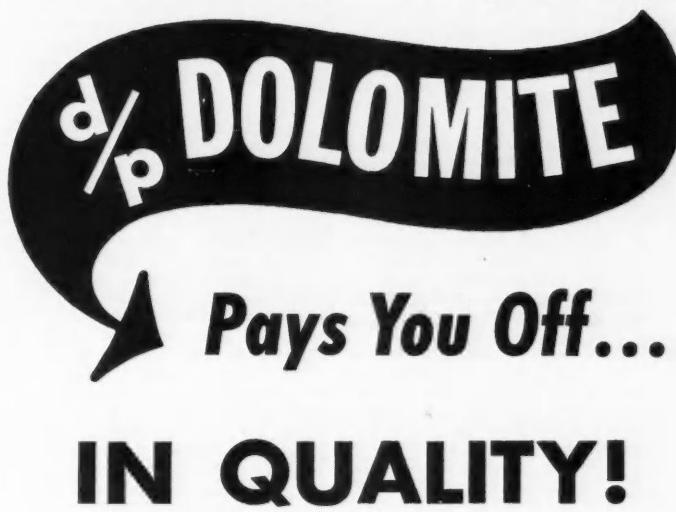
There are numerous instances of the long-distance transportation of living insects by means of airplanes. Evidence is abundant that some injurious species have been established in distant parts of the World through this means. It seems reasonable to believe that the danger of the long-distance dissemination of injurious insects through air travel is likely to increase unless definite measures are taken to prevent. With this objective experiments are being conducted to develop insecticides to be applied to interiors of airplanes. Planes from Hawaii are sprayed before departure from the Mainland, careful inspection is being made of foreign planes on arrival at the airports in this country, and representations have been made to the agricultural officials of other countries looking toward their adoption of precautions which might be of protection to them as well as to us.

Florida is interested in the status of the diseases of citrus known as mal secco, quick decline and tristeza, and of the infestations of the citrus blackfly in Mexico and the oriental fruit fly in Hawaii.

In Mexico work against the citrus blackfly has been carried on in cooperation with the Mexican Department of Agriculture and with committees of growers organized in some of the principal fruit-growing States of that country which have actively participated in the suppressive program. Infestation

was found early in 1950 as close to the border as Matamoros just across the Rio Grande from Brownsville. This was a light infestation found on one tree on a property within a few doors from the bus station which leads to the belief that the insect may have reached that point in connection with bus travel from interior points of Mexico. That infestation is believed to have been eradicated and no recurrence has been found to date despite frequent and careful in-

(Continued on page 16)



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Reports Of Our Field Men . . .

WEST CENTRAL FLORIDA E. A. (Mac) McCartney

Things are still pretty dry, however, we have had a few scattered showers, but they have not been plentiful all over the territory. We are hoping that the rainy season will get under way soon to help us because we have been through a long dry spell. In spite of the dry weather citrus seems to be sizing up well and most growers are fertilizing in preparation for the rainy season.

Insects are still a constant battle and we are in the process of spraying most groves with oil where weather conditions will permit. We had a bad infestation of six-spotted mite and red spider but the hot weather has about caught up with them and they are rapidly disappearing.

Our Summer application of fertilizer is nearing completion and prospects in general look very good for the coming season.

POLK, HIGHLANDS & HARDEE COUNTIES

J. M. Sample and Frank K. Chase

Generally speaking all of the Polk County area has had some good rains during the past several weeks. Fruit is sizing well and growers have about completed their Summer application of fertilizer. Now is a good time to check on your soil for pH reading and if soil amendments are necessary you should make plans to have this done in the very near future. Most growers who follow a good spray program are now preparing to apply oil for control of scale,

but care should be exercised to avoid extreme high temperature spray. All in all citrus prospects look fairly good for the coming season.

NORTH CENTRAL FLORIDA V. E. (Val) Bourland

We have been having some nice rains which have been welcomed by the fruit growers. Groves are looking good, and quite a shower of bloom, as well as growth, is coming. Most of the growers are through with their fertilizing, but lots of spraying and dusting is being done. Fruit is sizing up good and most groves have good crops. Cover crops are fine.

Melons are about over and growers busy trying to figure to break even. Pastures have also welcomed the rains. Cattle are looking fat and fine. Ditches are being cleaned out to take care of excess water as it falls.

HILLSBOROUGH & PINELLAS COUNTIES T. D. Watson

The somewhat delayed rains have at last started and all grove owners have stopped irrigating and started on their late June application of fertilizer. Everyone is hoping to have finished fertilizing by the first of July.

With the extreme dry weather that we have experienced citrus trees held up very nicely. In very few cases have I seen heavy drop page of young fruit or heavy defoliation. Where groves were disced too deeply during dry spells and adequate irrigation was not

available there has been cases of heavy defoliation, but generally speaking trees are in good condition.

There is still quite a lot of Valencias left on the trees but most everyone is trying to get them off as soon as possible.

Red spiders and rust mites are doing some damage throughout the territory but have been held in check fairly well.

All in all everyone is satisfied with the long season that has just closed and are anxious to finish up everything before the middle of July and take a vacation.

SOUTHWEST FLORIDA Eaves Allison

At this time, June 16th, there is no activity in this area among the vegetable growers. The season is over, and operations for the Fall deal have not started. It was a hard pull financially for a good many farmers during the Fall-Spring just past. However, most of them have squeezed by and made a little money.

Citrus growers who sold when they should have made good money, while those who held out for the top dollar have taken and are still taking a licking. The trees are still holding up well on the moisture that was supplied by the Winter and early Spring rains. In this area we are going into our seventh or eighth week of drought. There has been considerable fruit drop lately in groves which have not been irrigated. A number of growers are still waiting until it rains to apply their Summer fertilizer.

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ADVERTISEMENT — LYONS FERTILIZER COMPANY

Sample Leaves To Join Snow Crop

J. M. (Jim) Sample, for many years associated with the Lyons Fertilizer Company as salesman and more recently as manager of the Winter Haven office for the Company, is leaving to accept a position as production manager for Snow Crop, one of the largest citrus operators in the state.

During his long association with Lyons, Sample was recognized as an authority on citrus production problems and the best wishes of the Company go with him as he assumes his new position.

Frank K. Chase who has served as assistant to Sample in the management of the Winter Haven office will also join the staff of the Snow Crop organization.

Produce Maximum Crops of the Finest Quality with Lyons Fertilizers.

Joins Lyons Staff



Dr. J. T. (Jim) Griffiths
Will head Winter Haven Office

Griffiths To Manage Winter Haven Office

We are pleased to announce that Dr. J. T. (Jim) Griffiths who has been connected with the Florida Citrus Experiment Station at Lake Alfred for several years, is joining the staff of the Lyons Fertilizer Company and will become manager of our Winter Haven office, succeeding Sample in that capacity.

Dr. Griffiths is recognized as one of the outstanding citrus experts in the state and his services with the Company, we feel certain, will be of great value to many of our customers.

Dr. Griffiths in collaboration with other members of the Experiment Station staff, has for many months been carrying a series of articles in The Citrus Industry magazine each month dealing with the proper manner of effecting control of insect pests.

We are happy to announce this valued addition to our grower service department.



Uncle Bill Says:

There's a lot of good sound advice that can be given to citrus growers in reference to their production problems . . . but one thing every grower knows is that keepin' trees healthy and strong is one of the most important jobs every grower has to do in order to produce good fruit and a lot of it.

Lyons Fertilizers are helping hundreds of Florida growers do this job most effectively.

FLORIDA'S STAKE IN PLANT QUARANTINE ENFORCEMENT

(Continued from page 13)

spections. Bus travel is interrupted at the border as the vehicles themselves do not cross. The question whether the insect may be carried as a hitch-hiker on traffic crossing the line, however, is under investigation. This involves the possibility of spraying such vehicles in connection with their crossing and search is being made for a suitable spray.

Infestation now occurs in the City of Monterrey where spraying is being carried on at all points where living citrus blackflies are known to occur. Other infested areas in Mexico where suppressive measures are being applied include Victoria and one or two points between Victoria and Monterrey; also in the vicinity of Valles in the State of San Luis Potosi about 300 air miles south of the border where rather heavy infestations of the citrus blackfly have occurred over a period of several years. At that point a Bureau spray program is in progress on selected properties to demonstrate that fruit production can be restored if proper sprays are applied at the right time.

On the West Coast the infestations which were found in the vicinity of Guaymas and Empalme have been subjected to several spray applications. In this area it will be recalled the first suppressive measures were put into effect by the fruit growers of Arizona and California who contributed funds and sent their own men to supervise the program. In this initial effort the Bureau cooperated by determining the limits of infestation to the northward in co-operation with the Mexican Department of Agriculture. The number of infested properties has been steadily reduced as well as the intensity of the infestation.

In Cuba the citrus blackfly was found to be readily controlled by parasites. These same insects taken to Mexico and liberated there have not proven to be equally effective. It will be recalled that there was an infestation of the citrus blackfly in south Florida on Key West a number of years ago. Resort was not made to natural control at that time as it was deemed desirable to completely eradicate the infestation if possible and after a

spray program of some duration in which the Bureau cooperated with the State Plant Commissioner, it is believed the infestation was completely wiped out. Parasites were imported into Mexico during the season 1948-49 from Malaya. There was difficulty in making these introductions because the infestations were on citrus in that country. Because of the danger of bringing citrus canker infested materials to Mexico the procedure was to take potted citrus trees from Mexico to Malaya, there infest them with the citrus blackfly, then introduce the parasites, cage the infested plants and ship by water. Little success attended these efforts, perhaps because of the long period of time involved. In the season 1949-50, parasites were collected in India. In this instance it was possible to secure infested non-citrus leaves carrying the parasites. These were shipped at frequent intervals by air and a large amount of the material came through successfully. Sufficient time has not yet elapsed to permit an evaluation of the effectiveness of these beneficial insects. It would very greatly lessen the concern of the fruit growers of this country if biological control of the citrus blackfly in Mexico should prove to be effective.

With respect to the oriental fruit fly situation in the Hawaiian Islands, a very comprehensive research program was undertaken in the beginning of the fiscal year 1950 with funds made available by the first session of the 81st Congress. The work was divided into five main projects:

- (1) Biology and habits of the fruit fly
- (2) Treatment of agricultural products grown in infested areas so that they may be transported safely into uninfested areas
- (3) Search for insecticides that will kill the insect
- (4) Large-scale control and eradication studies
- (5) Biological control

The work in these lines of investigation has been vigorously prosecuted. The importations of beneficial insects have been very encouraging. A number of the imported species have been recovered from various parts of the Islands showing that they have become definitely established and at some points the parasitization

has reached an encouraging level. Active cooperation in the studies directed against the oriental fruit fly is being received from California and from Hawaii. The California State Department of Agriculture and the Citrus Experiment Station of the University of California have been actively cooperating. They have loaned men to this undertaking and accepted responsibility for certain activities associated with the general program. The Board of Agriculture and Forestry of Hawaii and the Hawaiian Experiment Station are also valued cooperators. The Pineapple Research Institute and the Hawaiian Sugar Planters Association Experiment Station are also giving valuable assistance.

Airplanes leaving Hawaii for the Mainland are given preflight inspection and are also sprayed in an effort to prevent hitch-hiking fruit flies. Careful inspection and treatment of products moving to the Mainland are required. California has been carrying on a trapping program in order that if the fly should find its way there the infestation would be discovered while still in the incipient stage. The results of this trapping program have thus far been negative in California.

Plant quarantine policies and procedures have been undergoing rather frequent and rapid changes. Progress in the development of insecticides, additional information as to the distribution and abundance of plant pests, and the possibility of long-distance dissemination all have contributed to this situation. In this country the State plant quarantine officials, by working together, have made notable progress in simplifying, coordinating and streamlining the State quarantines and procedures which affect interstate shipments of plants and plant products. Their organizations—the regional and the National Plant Boards—have afforded a medium for free friendly discussion of their mutual problems. It is believed that progress in dealing with other countries is possible through similar means. Long strides in this direction have been made in our dealings with our neighbors, Canada and Mexico. Working at greater distance there has been excellent ground work laid for further cooperative relationships with Argentina, Australia, and F

(Continued on page 17)

"Notes Of The Trade"

IS THIS THE ANSWER? KAY SAYS IT MAY BE

RUSSELL KAY, SECRETARY
FLORIDA PRESS ASSOCIATION

Fertilizing and spraying operations are costly, but the grower dare not eliminate them for it would eventually mean the loss of his grove as well as his crop. How then can he reduce these costs and at the same time obtain maximum results in the production of more and better fruit?

That without doubt is the \$64 question and anyone who can give the answer could realize a whole heck of a lot more than \$64. When my friend A. S. Metzner of Orlando asked me to come and inspect some of the groves on which he had introduced a new spraying program with startling results, I did so with plenty of skepticism for he told me he had a new spray that took the place of oil and did a better job.

Growers have depended upon oil sprays for so long that the idea of substituting something else in place of it seemed preposterous. However, Metzner seems to be doing it with a new spray he calls Double-X which controls spotted mites, scale, red spider, rust-mite and white fly soot, giving the tree a complete clean-up.

Using his Double-X as an all-purpose control spray he stimulates the health and growth of tree and fruit with a schedule of spraying with a tree and plant tonic called Maturox, which contains hormones and vitamins, sets the crop and materially reduces dropping and hastens maturity.

Approximately 2,000 acres in different sized blocks have been treated with this new spraying schedule and pack-out records on these sprayed blocks compared with pack-outs on previous years are truly amazing.

Checking the record on a 10-acre block of Hamlin's on lemon root, located near Gotha, from which the entire crop had to go to the juice plant for lack of solids the previous year, showed that under the new spraying program 66 per cent of the pack-out was top grade fruit.

I personally visited several of the blocks under test and talked

with growers who state that the new spraying program not only reduces spraying costs about 25 percent but does a thorough control job and the Maturox application prevents droppings and shows its effect within from ten days to two weeks with higher solids and earlier maturity.

The control spray can be applied at any time of year without injury to foliage and does not seal the pores which, in the case of an oil spray, has a tendency to reduce solids and delay maturity. Tests with blocks of Hamlin's on lemon root and Parson Browns on lemon root show higher solids and mature fruit as much as two weeks earlier than in adjoining blocks where other spray schedules were used and oil was employed.

The contention that growers of citrus can eliminate the use of oil sprays entirely is reactionary and so unconventional that old timers are inclined to scoff and laugh off the idea.

However, results produced in this program so far seem to indicate advantages well worth looking into.

Certainly if a new program could reduce spraying costs as much as 25 per cent and at the same time improve the general condition of the grove and results in a greater percentage of first quality fruit, growers might well afford to give it a fair test on blocks of their holdings. In doing so, grove owners should make sure that the recommended schedule is carefully followed and applications made according to directions and in a thorough manner.

RACE AND RACE, INC., EXPANDS

A. T. Race, Jr., President of Race and Race, Inc., Winter Haven, Florida, announces the purchase of the Stanford Packing House, north of the city, as the latest move to expand production facilities of Racebilt irrigation systems. "Approximately 400,000 square feet of floor space in the main plant alone," said Mr. Race, "means increased service to our many customers throughout the country." The transaction includes several buildings besides the main plant,

all equipment and adjacent properties.

"These new facilities," continued Mr. Race, "will be converted to the production of Racebilt aluminum irrigation systems. We plan to use our present plant to expand and improve our aluminum foundry, and in addition to carry on the manufacturing operations other than irrigation equipment."

FOSGATE AND PATRICK FORM ASSISTANCE PACT

In a surprise move which promises a new era of operating efficiencies and stabilization in the citrus industry Claud C. Mershon, General Manager of Fosgate Growers Cooperative of Orlando, Florida, and W. A. Patrick of Patrick Fruit Corporation, Sanford, Florida, have announced a mutual assistance pact which interrelates the interests of the two organizations but leaves the Patrick Fruit Corporation with complete identity and continued relationships with the growers from whom they have been buying and customers who have bought their products.

In a joint statement issued on June 16 Mershon and Patrick said: "The business of the Patrick Fruit Corporation has grown to the extent that we were forced into consideration of making extensive enlargements in our plant and equipment or to make an arrangement with some organization which already has the facilities to provide their use to us. An examination of facilities in the area led us to the conclusion that if we could arrange an agreement with Fosgate for the use of their facilities in handling our processing and packing that we would have all the advantages of the latest in citrus processing equipment without making a terrific outlay ourselves to duplicate these facilities."

FLORIDA'S STAKE IN PLANT QUARANTINE ENFORCEMENT

(Continued from page 16)

land. Better understandings lead to better cooperation. From our point of view better cooperation means fewer plant pests accompanying agricultural imports and that is the aim which must be kept ever before us.

South American Parasites To Battle Hawaiian Pests

Science is using the airplane in pitting insect against insect in a germ war to conquer the Oriental fruit fly, one of the most destructive of all agricultural pests.

A cigar-box full of 15,000 Brazilian fruit flies (*Anastrepha*)—unwilling hosts to a parasitical task force that entomologists hope will wipe out their Oriental cousins—are being flown from Rio de Janeiro to Hawaii by Pan American World Airways.

The Brazilian species are selected "sick" flies, doomed to death by the internal parasites with which they are infected.

They are harboring the tiny embryo of a variety of wasp that utilizes the fruit fly for propagation. The mother wasp catches a fly, deposits her eggs in the fly's body and eventually the infant wasp devours its host.

The Brazilian airbone parasites are not expected to hatch out of their carrier flies until they reach Hawaii. Then they will be released to attack the Oriental pests that

have caused tremendous damage to Hawaiian fruit crops since they appeared at the end of World War II.

It is a paradox of nature that the fly dies by the same type "time bomb" with which it destroys fruit. The female lays her eggs by puncturing the skin of a mango, avocado or what-have-you with her stinger, a sort of hypodermic needle. When the larvae hatch, they eat the pulp.

The Brazilian flies were obtained by Dr. Donald W. Clancy of the United States Department of Agriculture who spent six weeks in Brazil working with Dr. Jalmiro Gomes of the Brazilian Ministry of Agriculture.

Dr. Clancy, who is in charge of the campaign against the fruit fly in Hawaii, went to Brazil after a similar study in the Belgian Congo.

He is returning from Brazil through the West Indies by Clipper before going back to Hawaii in July.

research in these fields in accordance with TVA's established policy.

The Secretary of Agriculture and the Secretary of the Interior will each be invited to designate a representative to be kept informed as to meetings and, when appropriate, to participate.

To implement its part in the program and to establish liaison between NFA and TVA, NFA has engaged Edwin C. Kapusta to serve as secretary of its technical committee, effective July 2. Dr. Kapusta, who served in the Naval Reserve during 1945-1946, is a graduate of Rensselaer Polytechnic Institute, Troy, N. Y., and was awarded his Master's Degree in 1947 from Worcester Polytechnic Institute, Worcester, Mass., and his Ph.D in Chemical Engineering from Iowa State College at Ames this June. His thesis subject: "Quick Curing of Superphosphate." From

NFA AND TVA DEVELOP COOPERATIVE UNDERSTANDING

TVA and The National Fertilizer Association have signed a memorandum of understanding providing for increased exchange of information in the fields of fertilizer research, production, distribution and use. The new agreement follows several years of informal cooperation in these fields.

The understanding provides that each party will (1) appoint a committee to consult on broad policies of mutual interest, and (2) appoint a technical committee to meet regularly to exchange information, review fertilizer research and development programs, and discuss and recommend problems for study, each party to designate a staff member to serve as a liaison agent.

TVA will (1) use its fertilizer and munitions research facilities to the extent feasible for the purpose of conducting research and experimentation on problems relating to fertilizer processing and manufacture as agreed upon by the technical committees, and (2) continue to publish and make available to NFA and its members, as well as to others, the results of

July 1947 to September 1948 Dr. Kapusta was on the laboratory staff of the American Cyanamid Company at Stamford, Conn. The employment of Dr. Kapusta will allow NFA to broaden its technical services to its members.

WORLD CITRUS CROP LARGEST ON RECORD

According to announcement just made by the United States Department of Agriculture the world citrus crop from the bloom of 1950 is indicated to be 379.2 million boxes. It is the largest production on record, 12 percent higher than the 1949 crop of 339.9 million boxes and 38 percent higher than the prewar (1935-39) average of 274 million boxes. The increase was largely in orange and tangerine production which was 26.8 million boxes above 1949. World orange and tangerine production in 1950 of 297.6 million boxes is the highest on record, and 39 percent higher than the prewar average of 213.4 million boxes.

HARDEE ACHIEVEMENT DAY

Highlighting the first Achievement Day held by Hardee County home demonstration women was a dress revue. Mrs. Walter Wadsworth of the West Hardee Club was named winner and will represent the county in the state contest.

Mrs. Frances P. Dennington, home demonstration agent, reports that club exhibits included the seven phases of home demonstration work featured in the county in recent years.

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